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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/530,498	04/06/2005	David Keith Roberts	NL 021036	6668
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EXAMINER SCHWARTZ, DARREN B				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/530,498

**Applicant(s)**

ROBERTS, DAVID KEITH

**Examiner**

DARREN SCHWARTZ

**Art Unit**

2435

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 April 2005.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-21 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-9, 13 and 15-21 is/are rejected.  
7) ☒ Claim(s) 10-12 and 14 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 06 April 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO/SB-08)  
Paper No(s)/Mail Date 09-28-05  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Information Disclosure Statement***

The listing of references in the Search Report is not considered to be an information disclosure statement (IDS) complying with 37 CFR 1.98. 37 CFR 1.98(a)(2) requires a legible copy of: (1) each foreign patent; (2) each publication or that portion which caused it to be listed; (3) for each cited pending U.S. application, the application specification including claims, and any drawing of the application, or that portion of the application which caused it to be listed including any claims directed to that portion, unless the cited pending U.S. application is stored in the Image File Wrapper (IFW) system; and (4) all other information, or that portion which caused it to be listed. In addition, each IDS must include a list of all patents, publications, applications, or other information submitted for consideration by the Office (see 37 CFR 1.98(a)(1) and (b)), and MPEP § 609.04(a), subsection I. states, "the list ... must be submitted on a separate paper." Therefore, the references cited in the Search Report have not been considered. Applicant is advised that the date of submission of any item of information or any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the IDS, including all "statement" requirements of 37 CFR 1.97(e). See MPEP § 609.05(a).

The information disclosure statement filed 28 September 2005 fails to comply with 37 CFR 1.98(a)(1), which requires the following: (1) a list of all patents, publications, applications, or other information submitted for consideration by the Office;

(2) U.S. patents and U.S. patent application publications listed in a section separately from citations of other documents; (3) the application number of the application in which the information disclosure statement is being submitted on each page of the list; (4) a column that provides a blank space next to each document to be considered, for the examiner's initials; and (5) a heading that clearly indicates that the list is an information disclosure statement.

### ***Claim Objections***

Claims 20 and 21 objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

The Examiner suggests removing the dependence of claims 20 and 21 from claim 1.

### ***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

1. Claim 21 is rejected under 35 U.S.C. 101 because the claims for the invention are directed to non-statutory subject matter, as they do not fall under any of the statutory classes of inventions. The language in the claims raise an issue because the claims are directed merely to an abstract idea that is not tied to an article of manufacture which would result in a practical application producing a concrete, useful, and tangible result to form the basis of statutory subject matter under 35 U.S.C. 101.

The claims could reasonably be drawn to functional descriptive material, per se, i.e., "program" may be taken to mean software alone, and as such, the claims would be directed to non-statutory subject matter.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 4 recites "is adjusted according to previously thus far discovered mismatching authentication bits" and is unclear as to what applicant regards as "previously thus far discovered."

Any claim not specifically addressed above is being rejected as incorporating the deficiencies of a claim upon which it depends.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-9, 13 and 16-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwamura, Keiichi, (U.S. Pat Pub 2003/0012406 A1) hereinafter referred to as Iwamura in view of Rey, Christian et al, "A Survey of Watermarking Algorithms for Image Authentication," hereinafter referred to as Rey.

Re claim 1: Iwamura teaches a method of verifying the authenticity of media content (Fig 6: ¶127; ¶18-¶68), said method comprising the steps of:

extracting a sequence of first authentication bits from said media content [watermarked image  $I'(i, j)$ ] by comparing a property of the media content in successive sections of the media content with a second threshold (¶78; Abstract: "Check bits  $U(i, j)$  are obtained by encrypting pixel data by exclusively ORing respective bits, except for the LSBs, of B pixel data at positions  $(i, j)$  of the image  $I'(i, j)$  and the pseudo random numbers;" Fig 27C),

receiving a sequence of second authentication bits, said received sequence being extracted from an original version of the media content by comparing said property of the media content with a first threshold (¶9; ¶96; Figure 5), and

declaring the media content authentic if the received sequence of second authentication bits matches the extracted sequence of first authentication bits (Figure 22 and Figure 5; ¶118).

However, Rey teaches:

characterized in that the step of extracting the authentication bits from the media content comprises setting the second threshold in dependence upon the received authentication bits, such that the probability of an extracted authentication bit in said

sequence of first authentication bits mismatching the corresponding received authentication bit in said sequence of second authentication bits is reduced compared with using the first threshold for said extraction (page 617, section 2.3.2: "Block-based watermark;" particularly, *"If  $d < T$ , where  $T$  is a user-defined threshold, the tested block is considered genuine. While modifying the value of  $T$ , one tolerates more or less significant changes in the image"*).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the teachings of Iwamura with the teachings of Rey, for the purpose of refining the tolerance and location in watermark/tampering detection.

Re claim 2: The combination of Iwamura and Rey teaches the false alarm rate when verifying authenticity of said media content is reduced (Rey: page 620, left column: *"Additionally, digital signature methods offer an interesting alternative to classical watermarking techniques, insofar there is no longer a limitation in terms of capacity, nor a problem of robustness, thus offering better localization of the manipulated areas, better quality reconstruction, and a limited risk of false alarms."*).

Re claim 3: The combination of Iwamura and Rey teaches the step of extracting the authentication bits from the media content comprises controlling the threshold in dependence upon the received authentication bits such that the probability that an extracted authentication bit matches the corresponding received authentication bit is high (Iwamura: ¶¶92; ¶120; Rey: page 617, section 2.3.2: "Block-based watermark;" particularly, *"If  $d < T$ , where  $T$  is a user-defined threshold, the tested block is considered*

*genuine. While modifying the value of  $T$ , one tolerates more or less significant changes in the image").*

Re claim 4: The combination of Iwamura and Rey teaches controlling the second threshold during the step of extracting the authentication bits based upon the current mismatching authentication bits, in such a manner that the authenticity decision process is adjusted according to previously thus far discovered mismatching authentication bits, leading to improved localisation of non-authentic section(s) in said media content (Rey: page 617, section 2.3.2: "Block-based watermark;" particularly, "*If  $d < T$ , where  $T$  is a user-defined threshold, the tested block is considered genuine. While modifying the value of  $T$ , one tolerates more or less significant changes in the image*").

Re claim 5: The combination of Iwamura and Rey teaches declaring the media content as a whole tampered with, if the received sequence of second authentication bits does not match the extracted sequence of first authentication bits (Iwamura: Fig 8, elt 803; ¶135; Fig 10, elt 1005; ¶150).

Re claim 6: The combination of Iwamura and Rey teaches mis-matching bits between the received sequence of second authentication bits and the extracted sequence of first authentication bits comprise information on localisation of at least a first section in said media content, said method further comprising the step of identifying and/or marking the localisation of tampered sections in said media content for visualisation of at least one tampered section(s) (Rey: page 615: Figure 1b).

Re claim 7: The combination of Iwamura and Rey teaches subsequent phases in which the step of extracting is repeated using a modified second threshold (Rey: page



617, section 2.3.2: "Block-based watermark;" particularly, *"If  $d < T$ , where  $T$  is a user-defined threshold, the tested block is considered genuine. While modifying the value of  $T$ , one tolerates more or less significant changes in the image"*).

Re claim 8: The combination of Iwamura and Rey teaches said step of extracting is solely executed on sections of said media content neighbouring to sections of said media content being identified as tampered (Rey: page 615: Figure 1b).

Re claim 9: The combination of Iwamura and Rey teaches the second threshold being controlled in dependence upon the distance between the section for which the authentication bit is extracted and sections for which it has been found that the authentication bits mismatch the received authentication bits (Rey: page 617, section 2.3.2: "Block-based watermark;" particularly, *"If  $d < T$ , where  $T$  is a user-defined threshold, the tested block is considered genuine. While modifying the value of  $T$ , one tolerates more or less significant changes in the image"*).

Re claim 13: The combination of Iwamura and Rey teaches adjusting of said second threshold comprises adjusting the operating point or the decision boundary or prior probabilities according to context information as given by a neighbouring decision (Rey: page 617, section 2.3.2: "Block-based watermark;" particularly, *"If  $d < T$ , where  $T$  is a user-defined threshold, the tested block is considered genuine. While modifying the value of  $T$ , one tolerates more or less significant changes in the image"*).

Re claims 16-19: The combination of Iwamura and Rey teaches multimedia authentication decisions, wherein said multimedia comprises image or video and/or audio data; said multimedia authentication decisions are applied in surveillance

systems; adjustment of a decision boundary in multimedia authentication decisions is based on context information; said context information is based on proximity to areas already determined as tampered during tampering localisation of said multimedia (Rey: Figure 1b).

Re claim 20: Claim 20 is rejected under similar grounds as those provided for claim 1. The claimed limitations of claim 20 are fully encompassed by the limitations presented in claim 1.

Re claim 21: Claim 21 is rejected under similar grounds as those provided for claim 1. The claimed limitations of claim 21 are fully encompassed by the limitations presented in claim 1.

4. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Iwamura, Keiichi, (U.S. Pat Pub 2003/0012406 A1) hereinafter referred to as Iwamura in view of Rey, Christian et al, "A Survey of Watermarking Algorithms for Image Authentication," hereinafter referred to as Rey, in further view of common knowledge in the art.

Re claim 15: Common knowledge in the art teaches the second threshold used to determine the authentication bits represents an operation point on a ROC curve.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the teachings of Iwamura and Rey, with the teachings of common knowledge in the art, for the purpose of providing graphical analysis between sensitivity versus specificity. ROC curves are well known in signal detection theory.

***Allowable Subject Matter***

Claims 10-12 and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 10 recites the limitations the segments are blocks and the media content is a digital image, wherein the step of extracting comprises making an authentication decision for each block independently and the second threshold is firstly derived from a low false alarm operating point, wherein the step of declaring comprises declaring the image as authentic if no blocks are declared tampered or declaring the image as a whole being inauthentic if at least one tampered blocks are found, wherein blocks neighboring those that are tampered are declared having a higher probability of being tampered than non-neighboring blocks, and new operating points are selected for remaining blocks, not being declared tampered in previous runs, for repeated authentication decisions until no further tampered blocks are identified. The prior art does not teach nor suggest these claimed limitations.

Claims 11-12, which depend from claim 10 incorporate the subject matter of claim 10 and are allowable over the prior art.

Claim 14 recites the limitations wherein the second threshold is adjusted according to the formula:  $\lambda_i = \alpha\lambda_1 + (1 - \alpha)\lambda_2$  wherein  $\lambda_1 = 1$  and  $\lambda_2 > 1$  are decision thresholds, and  $\alpha$  is given by:  $\alpha = \left(\frac{n}{m}\right)\left(\frac{d - r_m}{d - 1}\right)$  and  $r_m = \min(r, d)$ , wherein n is the number of blocks neighboring block i that are marked as tampered, m is the total

number of blocks neighboring block  $i$ ,  $r$  is the distance in units of blocks of block  $i$  from the closest tampered block, and  $d$  is the maximum distance that sets how widely around a tampered block that suspicion is raised, wherein a subsequent authentication decision is re-evaluated using the new second threshold  $\lambda_i$ , and if further blocks are declared tampered in the subsequent authentication decision, the procedure of adjusting the second threshold and re-evaluating blocks, authenticity is repeated until no further tampered blocks are identified.

The prior art does not teach nor suggest these claimed limitations.

### ***Conclusion***

**Examiner's Note:** Examiner has cited particular columns and line numbers in the references applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses to fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the text of the passage taught by the prior art or disclosed by the examiner.

In the case of amending the claimed invention, Applicant is respectfully requested to indicate the portion(s) of the specification which dictate(s) the structure relied on for proper interpretation and also to verify and ascertain the metes and bounds of the claimed invention.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Xie, Lihua et al. "Approximate Image Message Authentication Codes."

Kundur, Deepa. "Digital Watermarking for Telltale Tamper Proofing and Authentication."

U.S. Pat 5452442 A

U.S. Pat 6633653 B1

U.S. Pat 7130443 B1

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DARREN SCHWARTZ whose telephone number is (571)270-3850. The examiner can normally be reached on 8am-4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim Vu can be reached on (571)272-3859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. S./  
Examiner, Art Unit 2435  
/Kimyen Vu/  
Supervisory Patent Examiner, Art Unit 2435